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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/798,157	03/11/2004	Wenjie Li	FIS920030393US1	7576
30449	7590	11/15/2005		
SCHMEISER, OLSEN + WATTS 3 LEAR JET LANE SUITE 201 LATHAM, NY 12110			EXAMINER LEE, SIN J	
			ART UNIT 1752	PAPER NUMBER

DATE MAILED: 11/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/798,157

Applicant(s)

LI ET AL.

Examiner

Sin J. Lee

Art Unit

1752

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 August 2005.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-5 and 7-20 is/are rejected.
7) ☒ Claim(s) 6 and 21 is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 11 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Claim Rejections - 35 USC § 103

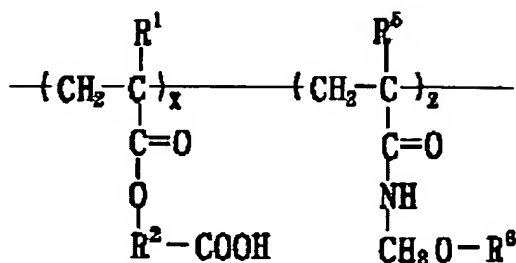
2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-5 and 7-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iwasa et al (JP 2000-63433 and its Chemical Abstract (132:187644), and its English translation provided by PTO) in view of Iwasa et al (6,074,801).

Iwasa et al (JP'433) teaches (see Chemical Abstract) a chemically amplified negative-working resist composition containing a polymer having the general formula (I) and a photoacid generator, and the polymer of the formula (I) is shown below:

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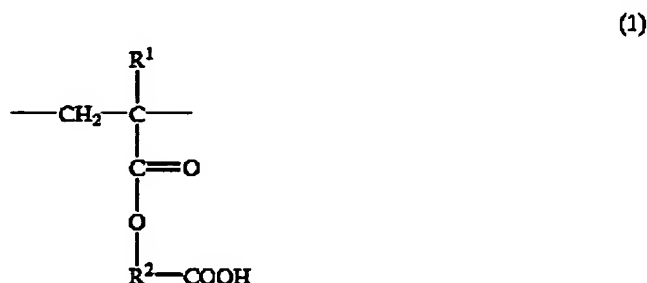


In the formula, R^5 can be H or $-\text{CH}_3$, and R^6 can be H or C_{1-12} alkyl group. Since the polymer has contains a carboxylic acid group (an aqueous base soluble moiety), the polymer would be soluble in an aqueous alkaline developer solution (in fact, Iwasa uses *aqueous* tetramethylammonium hydroxide solution as his developer to dissolve unexposed portions of his composition – see [0072] of English translation). Therefore, the prior art teaches present invention of claim 1 except for the present multihydroxy-containing additive.

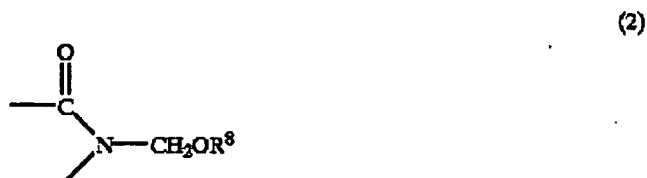
Iwasa et al'801 teaches the following (see col.3, lines 7-45):

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In order to achieve an aspect of the present invention, a negative type photoresist composition includes a polymer which contains a repetition unit which is expressed by a general chemical formula (1), a crosslinker composed of a compound which contains a functional group which is expressed by a general chemical formula (2), and a photo-acid generator which generates acid in response to a light. The general chemical formula (1) is as follows,



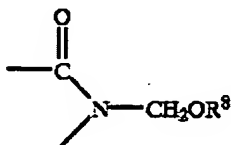
where in the general chemical formula (1), R^1 is a hydrogen atom or a methyl group, R^2 is an alkylene group containing carbon atoms in a range of 7 to 18 and having a bridged cyclic hydrocarbon group, and a weight average molecule weight of the polymer is in a range of 1000 to 500000. Also, the general chemical formula (2) is as follows,



where in the general chemical formula (2), R^8 is a hydrogen atom, or an alkyl group containing carbon atoms in a range of 1 to 6 or an oxoalkyl group containing carbon atoms in a range of 3 to 6.

The negative type photoresist composition may further include a polyhydric alcohol compound.

Iwasa'801 teaches (col.18, lines 4-26) that when his negative photoresist composition contains polyhydric alcohol, resolution can be improved *because the polyhydric alcohol has high reactivity with the crosslinker (which has the functional group of*



) so that the polyhydric alcohol acts as an accelerator of bridging.

As one of the examples for such polyhydric alcohol compound, Iwasa'801 discloses 1,4-cyclohexanediol.

Since Iwasa (JP'433)'s polymer shown above also contains the functional group of $\text{-C(=O)-NH-CH}_2\text{-O-R}^6$, and since Iwasa's composition is also negative-working, it would have been obvious to one of ordinary skill in the art to add a polyhydric alcohol compound such as 1,4-cyclohexanediol into Iwasa's composition in order to improve resolution as taught by Iwasa'801 (and, Iwasa (JP'433)'s polymer containing the functional group of $\text{-C(=O)-NH-CH}_2\text{-O-R}^6$ would chemically react with the 1,4-cyclohexanediol as taught by Iwasa'801). Therefore, Iwasa (JP'433) in view of Iwasa'801 would render obvious present inventions of claims 1-5.

With respect to present claim 7, Iwasa (JP'433) teaches (see English translation of [Claim 8]) that a sulfonium salt compound of the formula (7), which is shown below,



can be used as his photoacid generator. In the formula, R⁷-R⁹ can be an aromatic radical, and Y⁻ can be Z-SO³ in which Z can be C_nF_{2n+1} (n = 1-6). Therefore, it would have been obvious to one of ordinary skill in the art to have R⁷-R⁹ to be phenyl groups and Y⁻ to be C₄F₉SO₃⁻ with a reasonable expectation of obtaining a resist composition having transparency at short wavelengths such as ArF excimer laser light and etching-

resistance. Therefore, Iwasa (JP'433) in view of Iwasa'801 would render obvious present triphenylsulfonium perfluorobutanesulfonate of claim 7.

With respect to present claims 11 and 12, Iwasa (JP'433) teaches (see [0073] of English translation) the use of his polymer in the amount of 12.3 wt%, his photoacid generator in the amount of 0.65 wt.%, and his solvent in the amount of 87.0 wt.% in his photoresist composition. Therefore, Iwasa (JP'433) teaches present ranges of claims 11 and 12 for the polymer, solvent, and the acid generator. Iwasa'801 teaches (col.19, lines 4-9) that the polyhydric alcohol is used in the amount of 0.2-20 wt.% in order to accomplish improvement of resolution. Since this range overlaps with present ranges of claims 11 and 12 for the multihydroxy-containing additive, the prior art's teaching would have made present ranges *prima facie* obvious. In the case "where the [claimed] ranges overlap or lie inside ranges disclosed by the prior art," a *prima facie* case of obviousness would exist which may be overcome by a showing of unexpected results, In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976). Therefore, Iwasa (JP'433) in view of Iwasa'801 would render obvious present inventions of claims 11 and 12 (presence of the quencher is not required in present claims 11 and 12 because present claim 8 recites "at least *one* of a solvent and a quencher").

Iwasa (JP'433) teaches (see Chem. Abstract) that his resist composition is coated on a substrate, patternwise exposed to light of wavelength of 180-220 nm (in [0072] of English translation, Iwasa specifically teaches the use of an ArF excimer laser light (193.4 nm)), heat-treated, and then developed to form a resist pattern. Since Iwasa (JP'433) also mentions that his resist material shows improved dry etch

resistance, it is the Examiner's position that present etching step is impliedly taught by Iwasa (JP'433). Therefore, Iwasa (JP'433) in view of Iwasa'801 would render obvious present inventions of claims 13-18.

With respect to present claim 19, Iwasa (JP'433) teaches (see [0072] of English translation) a silicon wafer as his substrate. Therefore, Iwasa (JP'433) in view of Iwasa'801 would render obvious present invention of claim 19.

With respect to present claims 8-10 and 20, Iwasa (JP'433) teaches (see [0071] of English translation) the use of a solvent in his composition, which examples include methyl ethyl ketone and ethylene glycol monomethyl ether. Therefore, Iwasa (JP'433) in view of Iwasa'801 would render obvious present inventions of claims 8-10 and 20 (present claim language of claim 10 does not require the presence of the quencher because present claim 8 recites "*at least one* of a solvent and a quencher").

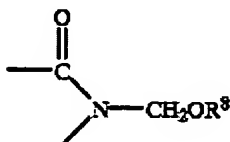
Allowable Subject Matter

4. Claims 6 and 21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Iwasa et al (JP'433) does not teach or suggest present fluorosulfonamide or fluoroalcohol moiety.

Response to Arguments

5. Applicants argue that the Examiner has not provided any evidence to demonstrate that the addition of a polyhydric alcohol into Iwasa JP'433's composition would improve resolution, nor any evidence to demonstrate that the addition of polyhydric alcohol into the composition of Iwasa JP'433 would not have adverse effects.

However, *reasonable expectation of success* is the standard with which obviousness is determined, and absolute predictability is *not required* for ultimate determination of obviousness. See Brown & Williamson Tobacco Corp. v. Philip Morris, Inc., 229 F.3rd 1120, 56 USPQ2d 1456 (Fed. Cir., 2000). It is the Examiner's position that Iwasa JP'433 and Iwasa'801, when considered as a whole, suggest the desirability of combination with reasonable expectation of success. Applicants also argue that the crosslinking reaction in Iwasa JP'433 is much more efficient than the crosslinking reaction in Iwasa'801 so that there is no demonstrated need for an acceleration of bridging in Iwasa JP'433. However, as already explained above, Iwasa'801 teaches that when his negative photoresist composition contains polyhydric alcohol, resolution can be improved *because the polyhydric alcohol has high reactivity with the crosslinker (which has the functional group of*



) so that the polyhydric alcohol acts as an accelerator of bridging.

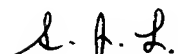
Since Iwasa (JP'433)'s polymer shown above also contains the functional group of – C(=O)-NH-CH₂-O-R⁶, and since Iwasa's composition is also negative-working, it is the Examiner's position that one of ordinary skill in the art would have been sufficiently motivated to add a polyhydric alcohol compound such as 1,4-cyclohexanediol into Iwasa's composition so as to further improve resolution *even more*.

Therefore, in the absence of showing of unexpectedly superior results, present 103(a) rejection still stands.

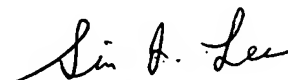
6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sin J. Lee whose telephone number is 571-272-1333. The examiner can normally be reached on Monday-Friday from 9:00 am EST to 5:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia Kelly, can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is **571-273-8300**.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



S. Lee
November 13, 2005



SIN LEE
PRIMARY EXAMINER